L19: Entry 1 of 1 File: USPT Dec 21, 1999

DOCUMENT-IDENTIFIER: US 6006191 A
TITLE: Remote access medical image exchange system and methods of operation therefor

Brief Summary Text (21):
U.S. Pat. No. ,5,321,520, which is incorporated herein by reference for all purposes, discloses an automated high definition/resolution image storage, retrieval and transmission system for use in hospitals capable of storing, transmitting and displaying medical diagnostic quality images for use with medical X-ray films or the like. As shown in FIG. 1, the system disclosed by the '520 patent includes components for processing the image data from patient imaging to physician usage. FIG. 1 illustrates an automated high definition/resolution image storage, retrieval and transmission system 10 for use with medical X-ray film 12. System 10 includes an image scanning and digitizing means 14 to transform the visual image from the medical X-ray film 12 or other documents into digital data, an image data storage and retrieval means 16 to store and selectively transfer digital data upon request, a telecommunication means 18 to selectively receive digital data from the image data storage and retrieval means 16 for transmission to one of a plurality of remote visual display terminals each indicated as 20 upon request from the respective remote visual display terminal 20 through a corresponding communications network 21 such as a telephone line, satellite link, cable network or local area network such as Ethernet or an ISDN service for conversion to a visual image for display at the remote requesting site.

Detailed Description Text (32):
The computer 510 in the gatekeeper's office 500, as well as the computer 310 at the imaging center 300, include specialized software for connecting to the CHC 200. The software contains an electronic medical form (EMF), which is filled out by the patient/gatekeeper. All of the necessary medical information is entered into the EMF, with all information being entered in "fields" which can be used to track and control the reading process, as discussed in greater detail below. Preferably, the EMF can include the Acquisition Site Identification Number, Gatekeeper Identification Number and a Patient Identification Number. The operating software turns the EMF is into a computer file and electronically attaches the digitized "diagnostic medical image" to the form. The entire computer file thus becomes the patient's Electronic Medical Record (EMR). Finally, a Document Control Number (DCN) is assigned to the patient's EMR, which advantageously allows the patient/gatekeeper, the diagnostic physician performing the reading, and the operating system of the CHC 200 to follow (track) and access the EMR as it moves through the RAMIX system. Preferably, security measures e.g., passwords, are implemented to maintain the privacy of the patient's EMR. It will also be recognized the DCN advantageously may include identifiers to indicate such things as the acquiring modality and subspecialty within the modality, to all system users.

Detailed Description Text (54):
When the patient/gatekeeper requests that a particular diagnostic provider perform the reading, the patient's EMI advantageously contains both the PMB address and an amount the patient is willing to pay for the diagnostic service. Advantageously, the patient/gatekeeper can also specify such things as the time limit for doing the reading and an alternative diagnostic physician so that, in the event that the primary diagnostic physician cannot or will not complete the patient's reading before the time expires, the patient's EMR is transferred to the PMB of a secondary diagnostic physician. As will be discussed in greater detail below, once the medical image has been sent to the CHC 200, the software operating the CHC 200 will enter the

EMR into the physician's mail box and reprioritize all EMRs according to the bid amounts offered for the services. Once the physician logs on to the RAMIX system, he/she can enter his/her personal PMB using a security code, and look over the directory of EMR labels identifying medical images that are waiting to be read. The diagnostic physician will determine whether to read or reject any particular image. Moreover, the diagnostic physician alone decides what fees he/she will accept or reject for his/her reading. It will be appreciated that for those physicians who are truly gifted in the profession the demand for their diagnostic services will be high and, thus, they can justifiably charge higher amounts for their services, according to the basic law of supply and demand in a free and open marketplace. It should also be mentioned that the RAMIX system places no restrictions on how fast the medical images must be read, unlike those in the patient bid queues.

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L21: Entry 1 of 1 File: USPT Oct 13, 1998

DOCUMENT-IDENTIFIER: US 5822544 A
TITLE: Patient care and communication system

Brief Summary Text (7):
Current systems utilized to manage such information includes the manual writing and processing of the information. Electronic systems utilized to process and store the information involve multiple computers, each configured to process portions of the vast amount of information. To obtain all the information in one place the information stored in each computer system must be manually combined. Furthermore, such electronic systems do not provide visual displays of text at stations provided in the patient's room, at the nurse control station or at stations provided in areas of the health care facility frequently occupied by the health care personnel.

Detailed Description Text (21):
As shown in FIG. 22, the base unit may also include a key pad 2218 and screen 2220. The screen provides instructions for the user and the keypad adds security to the system by requesting a personal identification number (PIN) before programming the card holder 1111.

Detailed Description Text (23):
If the entered PIN does not match the PIN read from the staff card, an alarm may be sounded and the information from the card may not be programmed onto the card holder. In this way, the likelihood that an unauthorized person could use a stolen staff card is decreased and the security of the apparatus is increased. To prevent unnecessary alarms, it may be desirable to sound the alarm only after the individual has entered an incorrect wrong PIN a number of times in succession. Alternatively, instead of sounding an alarm, the base unit may be designed to automatically transfer the card from the programming slot 2214 to a secure holding area (not shown) when the individual has failed to provide a correct PIN after a number of attempts.

Detailed Description Text (145):
The system described above in reference to FIGS. 1-16 may be used in a hospital environment to monitor the usage of controlled substances such as prescription drugs. FIGS. 20a through 20e illustrate an exemplary system for auditing drugs which are stored in a drug locker. The invention does not significantly impede the access of individuals to the drug locker, unlike if using normal physical security measures such as a locker from heavy gauge steel and placing a lock on the door.

Detailed Description Text (149):
FIG. 20d is a flow-chart diagram which illustrates the portion of the drug audit process that utilizes the circuitry shown in FIG. 20b. At step 2050, whenever a badge transmitter normally worn by a hospital staff member is within a preset distance, for example, one meter of fixed transceiver 2014, the transceiver receives the identification signal from the badge at step 2052. Next, at step 2057, the keyboard and display unit 2015 prompts for a personal identification number (PIN) stored in the central computer 432 as being associated with this badge. This PIN may be the same number as is used to obtain the badge from the base unit or, for enhanced security it may be a different number.

Detailed Description Text (221):
Display circuitry 3314 includes microprocessor 3346, such as model 8051 manufactured by Intel,

L7: Entry 1 of 2 File: USPT Aug 22, 2000

DOCUMENT-IDENTIFIER: US 6106301 A
TITLE: Interventional radiology interface apparatus and method

Brief Summary Text (7):
The prior art has attempted to overcome the above described disadvantages of utilizing live patients to train physicians or other medical professionals to perform various minimally invasive surgical procedures by employing simulation techniques. In particular, U.S. Pat. No. 4,907,973 (Hon) discloses an expert system simulator for modeling realistic internal environments. The simulator may be utilized to simulate an angioplasty-balloon operation wherein a mock catheter is inserted and manipulated within an internal arterial modeling device. The internal arterial modeling device may include mock arterial paths with sensors to track the progress of the inserted catheter within those paths. A computer retrieves and processes data from storage based on sensor data received from the internal sensors, and sends the processed data to a display that provides a visual display simulating a realistic environment (e.g., a view of the catheter within an arterial network).

Brief Summary Text (8):
U.S. Pat. No. 4,642,055 (Saliterman) discloses a hemodynamic monitoring training system that allows medical professionals to obtain substantial experience in hemodynamic monitoring (i.e., placement of a catheter passed from a distant vein through the heart to the pulmonary vasculature for purposes of measuring intracardiac, pulmonary artery and wedge pressures to determine the type or extent of cardiopulmonary disease, to evaluate therapeutic measures and to monitor cardiac function). The system includes a trainer, computer, display, keyboard and mouse and simulates the catheterization process. A catheter having a balloon disposed at its distal end is inserted within a trainer manikin at a catheter insertion point. The balloon is typically inflated to assist the catheter tip through the heart, and may be inflated in the pulmonary artery to measure wedge pressure. The manikin includes tubes representing veins extending internally from the insertion points, and a position sensor that measures advancement of the catheter tip past the sensor. The sensor data enables the computer to determine the location of the catheter tip within a corresponding actual human body based on catheter manipulation within the trainer manikin. The computer receives signals from the trainer and may provide on the display a simulated fluoroscope image showing simulated movement of the catheter through the heart and vasculature.

Brief Summary Text (26):
The injection syringe is manipulated to simulate injections of contrast fluid or other pharmaceutical substances, typically through the sheath or catheter, into a bodily region of interest. A tracking unit, associated with the injection syringe, is disposed within the interface device to measure syringe manipulation. The syringe tracking unit typically includes a rack gear and corresponding pinion interfacing an optical encoder to measure syringe manipulation. A cable extends from the distal end of an injection syringe plunger to the rack gear wherein manipulation of the injection syringe enables the cable to initiate rack gear motion. The optical encoder measures pinion rotation in response to rack gear motion, thereby providing a measurement of injection syringe manipulation. The injection syringe manipulation measurement enables the medical procedure simulation system computer to simulate an injection of a corresponding quantity of fluid into the bodily region of interest. The foot switch is actuated to enable display of a fluoroscope image on the medical procedure simulation system display showing a blockage within the virtual arterial network subsequent to simulated injection of contrast fluid.

Detailed Description Text (27):
The interface device peripherals may be implemented by any medical instruments utilized in medical procedures, and may be disposed in the housing and/or through the apertures in any fashion. Alternatively, the interface device peripherals may be implemented by any computer or other types of input devices to enter data corresponding to medical instrument manipulation into a medical procedure simulation system. The guidewire, catheter, and sheath may be implemented by any conventional guidewire, catheter and sheath or by a series of wire-like members or tubes. The foot switch may be implemented by any conventional foot or other type switch to enable the system display.

Other Reference Publication (28):
Shahidi et al, "Clinical Applications of Three Dimensional Rendering of Medical Data Sets", Proceedings of IEEE, vol. 86, No. 3, Mar. 1998, pp. 555-568.

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